UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,447	01/08/2002	Stephan Oliver Mietens	PHNL 010028	4625

			EXAMINER
24737	7590	12/03/2004	LERNER, MARTIN

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ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	10/042,447	MIETENS ET AL.
	Examiner	**Art Unit**
	Martin Lerner	2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 to 25* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 to 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>14 August 2003</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Specification

1.   The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested:

An Algorithm for Coding Coefficients by Calculation Costs

2.   The disclosure is objected to because of the following informalities:

The Specification does not contain headings as is conventional under patent practice in the United States. Headings should be added for "Background of the Invention", "Summary of the Invention", "Brief Description of the Drawings", and "Detailed Description of the Preferred Embodiments".

On page 1, line 27, "excepted" should be –accepted—.

On page 3, line 13, "the, the" should be --, the—.

On page 7, line 19, "angel" should be –angle—.

On page 7, line 24, "multiplication's" should be –multiplications—.

On page 8, line 6, there is an unmatched parenthesis.

On page 12, line 25, "memory 403" should be –memory 402—.

Appropriate correction is required.

Information Disclosure Statement

3.   It is requested that Applicants provide copies of the prior art cited on Page 14 of

the Specification. The Specification cites these articles in disclosing the invention, and

the articles are not readily available to the Patent Office, but are relevant to

understanding the invention with respect the prior art.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 1 to 8, 14 to 18, 21, and 24 to 25 are rejected under 35 U.S.C. 102(e) as

being anticipated by *lu et al.*

Regarding independent claims 1, 14, 15, 17, and 18, *lu et al.* discloses a method

of coding coefficients, comprising:

"selecting coefficients to be calculated, out of a total set of possible coefficients

that can be calculated by the given algorithm given the set of input values, in which

selection priorities depend on calculation costs of the respective possible coefficients,

and calculating the selected coefficients to obtain the set of coefficients" – the choice of

the total number of coefficients is traded against robustness and computational cost;

various embodiments provide schemes to handle the selection of coefficients to be

calculated; zig-zag sequential order of coefficient coding is provided to concentrate on

coefficients of energy in low frequency bands; the number of coefficients may be

gradually added until a maximum preset number of coefficients are reached; only

coefficients with magnitude greater than a threshold may be coded (column 7, line 35 to

column 9, line 45).

Regarding claims 2, 6, and 16, *Iu et al.* discloses coefficients are coded with

look-up tables, where basis functions at fixed sampling points may be pre-calculated

and stored for fast retrieval since they are repeatedly referenced during each iteration

(column 8, line 61 to column 9, line 9); thus, pre-calculated basis functions at fixed

sampling points are "calculations that can be shared with the calculation of other

selected coefficients" and "wherein . . . results of shared calculation steps are re-used";

implicitly, a total calculation cost includes reducing cost with look-up tables.

Regarding claims 3 and 4, *Iu et al.* discloses new coefficients are added until a

preset maximum number of coefficients are reached (column 7, line 60 to column 8, line

7); a maximum number of coefficients corresponds to maximizing the number of

coefficients "given a maximum total calculation cost."

Regarding claim 5, *Iu et al.* discloses new coefficients are added until a preset

maximum number of coefficients are reached (column 7, line 60 to column 8, line 7);

reaching a preset maximum number of coefficients corresponds to "until a stop criterion

is met"; moreover, choosing coefficients by zig-zag scanning order and by thresholds

involves minimizing the calculation cost of a coefficient with respect to other possible coefficients.

Regarding claims 7 and 8, *Iu et al.* discloses thresholding of coefficients to be calculated based on gradient magnitude or residual differences (column 8, lines 9 to 41); thresholding of coefficients to be calculated represents "at least one additional criterion is used in selecting coefficients to be calculated"; zig-zag sequential ordering of coefficients under a constraint of a maximum number of coefficients or discarding coefficients whose intensity gradient magnitude is less than a threshold T_g is equivalent to "a calculation cost is weighted by a priority function"; weighting could be a delta function, e.g. weighting by "0" or "1".

Regarding claims 21, 24, and 25, *Iu et al.* discloses coefficients for vector fields are stored (column 1, lines 39 to 44); optical flow calculator 600 is "a processor to carry out the method" (column 10, lines 4 to 40: Figure 6).

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 9, 19, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Iu et al.* in view of *Kim et al.*

Iu et al. discloses calculating coefficients according to zig-zag sequential

scanning order (column 7, lines 53 to 60), but omits including information about the

scanning order in the output signal. However, it is known to include information about

the scanning order in the output signal when the scanning order is varied from a

standard sequential ordering. *Kim et al.* teaches varying the scanning order by scan

interleaving to reduce the number of coding bits. (Column 4, Lines 7 to 13) In that

case, additional information with a decided scanning order is transmitted to the decoder.

(Column 4, Lines 30 to 37: Abstract) Thus, the decoder is informed of the scanning

order used during coding so that the decoder may properly decode the coded

information. It would have been obvious to one having ordinary skill in the art to

transmit the scan order to the decoder as taught by *Kim et al.* in the method of

calculating coefficients according to scanning order of *Iu et al.* for the purpose of

reducing the number of coding bits.

8.   Claims 10, 11, and 20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over *Iu et al.* in view of *Lengwehasatit*.

Iu et al. discloses calculating coefficients according to zig-zag sequential

scanning order (column 7, lines 53 to 60), and also says that newly added coefficients

are initialized to zero (column 7, lines 61 to 67). It is well known that algorithms

commonly provide for coefficients whose values are not known by setting them to zero,

but *Iu et al.* does not expressly say that choice of coefficients by scanning order sets

some of the coefficients to zero. However, *Lengwehasatit* teaches pruning coefficients

for an Inverse Discrete Cosine Transform (IDCT) by setting 64 minus M coefficients to zero by scanning order. (Column 2, Lines 21 to 65) The objective is to reduce the complexity of performing an Inverse Discrete Cosine Transform (IDCT). (Column 2, Lines 13 to 20) It would have been obvious to one having ordinary skill in the art to set coefficients to zero by scanning order as taught by *Lengwehasatit* in the method of calculating coefficients according to scanning order of *Iu et al.* for the purpose of reducing the complexity of performing an Inverse Discrete Cosine Transform (IDCT).

9.   Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Iu et al.* in view of *Conkie*.

Iu et al. provides a look-up table for calculating coefficients (column 8, line 61 to column 9, line 7), but omits a database containing calculation costs of coefficients in the form of a list of which coefficients can be calculated as a function of a given maximum number of calculation steps. However, *Conkie* generally teaches a database of calculation costs in an analogous art field of endeavor, where pre-calculated units are stored as a list. (Abstract; Column 2, Lines 44 to 55; Column 4, Lines 57 to 67: Figures 5 and 6) The objective is to reduce the number of calculations performed in real time. (Abstract; column 5, Lines 15 to 53) It would have been obvious to one having ordinary skill in the art to provide a database containing calculation costs of coefficients in the form of a list of coefficients as taught by *Conkie* in the method of calculating coefficients according to scanning order of *Iu et al.* for the purpose reducing the number of calculations that must be performed in real time.

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to

Applicants' disclosure.

Augenbraun et al. and Tonomura disclose related art.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Martin Lerner whose telephone number is (703) 308-

9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to

Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone

number for the organization where this application or proceeding is assigned is 703-

872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ML
12/1/04

Martin Lerner
Examiner
Group Art Unit 2654